

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (original): A nanocomposite magnet having a composition represented by the general formula: $R_xQ_yM_z(Fe_{1-m}T_m)_{bal}$, where R is at least one rare-earth element, Q is at least one element selected from the group consisting of B and C, M is at least one metal element that is selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Cu, Zn, Ga, Zr, Nb, Mo, Ag, Hf, Ta, W, Pt, Au and Pb and that always includes Ti, T is at least one element selected from the group consisting of Co and Ni, and the mole fractions x, y, z and m satisfy the inequalities of

$$6 \text{ at\%} \leq x < 10 \text{ at\%},$$

$$10 \text{ at\%} \leq y \leq 17 \text{ at\%},$$

$$0.5 \text{ at\%} \leq z \leq 6 \text{ at\%} \text{ and}$$

$$0 \leq m \leq 0.5, \text{ respectively,}$$

the nanocomposite magnet including a hard magnetic phase and a soft magnetic phase that are magnetically coupled together,

wherein the hard magnetic phase is made of an $R_2Fe_{14}B$ -type compound, and

wherein the soft magnetic phase includes an α -Fe phase and a crystalline phase with a Curie temperature of 610 °C to 700 °C as its main phases.

Claim 2 (original): The nanocomposite magnet of claim 1, wherein $6 \text{ at}\% \leq x \leq 8 \text{ at}\%$, and

wherein the crystalline phase included in the soft magnetic phase has a Curie temperature of 610°C to 650°C .

Claim 3 (currently amended): The nanocomposite magnet of claim 1 or 2, wherein Ti accounts for 0.25 at% to 6 at% of the overall magnet.

Claim 4 (currently amended): The nanocomposite magnet of claim 1 or 2, wherein the content of the crystalline phase included in the soft magnetic phase is greater than that of an Fe_3B -type compound phase.

Claim 5 (currently amended): The nanocomposite magnet of claim 1 or 2, wherein the $\text{R}_2\text{Fe}_{14}\text{B}$ -type compound phase has an average grain size of 10 nm to 70 nm, and

wherein a soft magnetic phase with an average grain size of 1 nm to 10 nm is present on the grain boundary of the $\text{R}_2\text{Fe}_{14}\text{B}$ -type compound phase.

Claim 6 (original): A rapidly solidified alloy to make a nanocomposite magnet, the alloy having a composition represented by the general formula: $\text{R}_x\text{Q}_y\text{M}_z(\text{Fe}_{1-m}\text{T}_m)_{\text{bal}}$, where R is at least one rare-earth element, Q is at least one element selected from the group consisting of B and C, M is at least one metal element that is selected from the group

consisting of Al, Si, Ti, V, Cr, Mn, Cu, Zn, Ga, Zr, Nb, Mo, Ag, Hf, Ta, W, Pt, Au and Pb and that always includes Ti, T is at least one element selected from the group consisting of Co and Ni, and the mole fractions x , y , z and m satisfy the inequalities of

$$6 \text{ at}\% \leq x < 10 \text{ at}\%,$$

$$10 \text{ at}\% \leq y \leq 17 \text{ at}\%,$$

$$0.5 \text{ at}\% \leq z \leq 6 \text{ at}\% \text{ and}$$

$$0 \leq m \leq 0.5, \text{ respectively,}$$

wherein the alloy includes an $R_2Fe_{14}B$ -type compound, an α -Fe phase, and a crystalline phase with a Curie temperature of 610°C to 700°C .

Claim 7 (original): The rapidly solidified alloy of claim 6, wherein $6 \text{ at}\% \leq x \leq 8 \text{ at}\%$, and

wherein the crystalline phase included in a soft magnetic phase has a Curie temperature of 610°C to 650°C .

Claim 8 (original): A method of making a rapidly solidified alloy as a material for a nanocomposite magnet, the method comprising the steps of:

preparing a molten alloy having a composition represented by the general formula: $R_xQ_yM_z(Fe_{1-m}T_m)_{bal}$, where R is at least one rare-earth element, Q is at least one element selected from the group consisting of B and C, M is at least one metal element that is selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Cu, Zn, Ga, Zr, Nb, Mo, Ag, Hf, Ta, W, Pt, Au and Pb and that always includes Ti, T is at least one element selected

from the group consisting of Co and Ni, and the mole fractions x , y , z and m satisfy the inequalities of

$$6 \text{ at}\% \leq x \leq 8 \text{ at}\%,$$

$$10 \text{ at}\% \leq y \leq 17 \text{ at}\%,$$

$$0.5 \text{ at}\% \leq z \leq 6 \text{ at}\% \text{ and}$$

$$0 \leq m \leq 0.5, \text{ respectively, and}$$

quenching the molten alloy by bringing the molten alloy into contact with the surface of a rotating chill roller, thereby forming a rapidly solidified alloy,

wherein the step of quenching includes adjusting a quenching rate within the range of 2.2×10^5 K/s to 2.8×10^5 K/s when the surface temperature of the alloy decreases from 900°C to 700°C .

Claim 9 (original): A method of making a rapidly solidified alloy as a material for a nanocomposite magnet, the method comprising the steps of:

preparing a molten alloy having a composition represented by the general formula: $R_x Q_y M_z (\text{Fe}_{1-m} \text{T}_m)_{\text{bal}}$, where R is at least one rare-earth element, Q is at least one element selected from the group consisting of B and C, M is at least one metal element that is selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Cu, Zn, Ga, Zr, Nb, Mo, Ag, Hf, Ta, W, Pt, Au and Pb and that always includes Ti, T is at least one element selected from the group consisting of Co and Ni, and the mole fractions x , y , z and m satisfy the inequalities of

$$8 \text{ at}\% < x < 10 \text{ at}\%,$$

$10 \text{ at}\% \leq y \leq 17 \text{ at}\%$,

$0.5 \text{ at}\% \leq z \leq 6 \text{ at}\%$ and

$0 \leq m \leq 0.5$, respectively, and

quenching the molten alloy by bringing the molten alloy into contact with the surface of a rotating chill roller, thereby forming a rapidly solidified alloy,

wherein the step of quenching includes adjusting a quenching rate within the range of $2.2 \times 10^5 \text{ K/s}$ to $4.5 \times 10^5 \text{ K/s}$ when the surface temperature of the alloy decreases from 900°C to 700°C .

Claim 10 (currently amended): The method of claim 8 ~~or 9~~, wherein the step of quenching includes adjusting a quenching rate at $4.0 \times 10^5 \text{ K/s}$ or more when the surface temperature of the alloy decreases from $1,300^\circ\text{C}$ to 900°C .

Claim 11 (original): The method of claim 8, wherein the step of quenching includes making a crystalline phase, included in the rapidly solidified alloy, account for more than 50 vol% of the entire rapidly solidified alloy.

Claim 12 (currently amended): A method for producing a nanocomposite magnet, the method comprising the steps of

making a rapidly solidified alloy by the method of one of claims 8 to 11, and
thermally treating the rapidly solidified alloy, thereby forming a nanocomposite structure in which hard magnetic phases of an $\text{R}_2\text{Fe}_{14}\text{B}$ -type compound and soft magnetic

phases, consisting essentially of an α -Fe phase and a crystalline phase with a Curie temperature of 610 °C to 650 °C, are magnetically coupled together.

Claim 13 (original): A decision method for a nanocomposite magnet, the method comprising the steps of:

preparing multiple rapidly solidified alloys as materials for a nanocomposite magnet, each said alloy having a composition represented by the formula: $R_xQ_yM_z(Fe_{1-m}T_m)_{bal}$, where R is at least one rare-earth element, Q is at least one element selected from the group consisting of B and C, M is at least one metal element that is selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Cu, Zn, Ga, Zr, Nb, Mo, Ag, Hf, Ta, W, Pt, Au and Pb and that always includes Ti, T is at least one element selected from the group consisting of Co and Ni, and the mole fractions x, y, z and m satisfy the inequalities of

$$6 \text{ at\%} \leq x < 10 \text{ at\%},$$

$$10 \text{ at\%} \leq y \leq 17 \text{ at\%},$$

$$0.5 \text{ at\%} \leq z \leq 6 \text{ at\% and}$$

$$0 \leq m \leq 0.5, \text{ respectively, and}$$

determining whether or not a rapidly solidified alloy to make a nanocomposite magnet, which has been selected from the multiple rapidly solidified alloys, includes a soft magnetic phase having a Curie temperature of 610 °C to 700 °C.

Claim 14 (original): The method of claim 13, wherein $6 \text{ at\%} \leq x \leq 8 \text{ at\%}$, and wherein the crystalline phase included in the soft magnetic phase has a Curie

temperature of 610 °C to 650 °C .

Claim 15 (original): The method of claim 14, wherein the step of determining includes subjecting the rapidly solidified alloy to make a nanocomposite magnet to thermogravimetry.

Claim 16 (original): . A nanocomposite magnet having a composition represented by the general formula: $R_xQ_yM_z(Fe_{1-m}T_m)_{bal}$, where R is at least one rare-earth element, Q is at least one element selected from the group consisting of B and C, M is at least one metal element that is selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Cu, Zn, Ga, Zr, Nb, Mo, Ag, Hf, Ta, W, Pt, Au and Pb and that always includes Ti, T is at least one element selected from the group consisting of Co and Ni, and the mole fractions x, y, z and m satisfy the inequalities of

$$6 \text{ at\%} \leq x < 10 \text{ at\%},$$

$$10 \text{ at\%} \leq y \leq 17 \text{ at\%},$$

$$0.5 \text{ at\%} \leq z \leq 6 \text{ at\%} \text{ and}$$

$$0 \leq m \leq 0.5, \text{ respectively,}$$

the nanocomposite magnet including a hard magnetic phase and a soft magnetic phase that are magnetically coupled together,

wherein the hard magnetic phase is made of an $R_2Fe_{14}B$ -type compound, and

wherein the soft magnetic phase includes an α -Fe phase and an Fe_2B phase as its main phases.

Claim 17 (original): The nanocomposite magnet of claim 16, wherein 6 at% $\leq x \leq 8$ at%.

Claim 18 (original): A rapidly solidified alloy to make a nanocomposite magnet, the alloy having a composition represented by the general formula: $R_xQ_yM_z(Fe_{1-m}T_m)_{bal}$, where R is at least one rare-earth element, Q is at least one element selected from the group consisting of B and C, M is at least one metal element that is selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Cu, Zn, Ga, Zr, Nb, Mo, Ag, Hf, Ta, W, Pt, Au and Pb and that always includes Ti, T is at least one element selected from the group consisting of Co and Ni, and the mole fractions x, y, z and m satisfy the inequalities of

$$6 \text{ at\%} \leq x < 10 \text{ at\%},$$

$$10 \text{ at\%} \leq y \leq 17 \text{ at\%},$$

$$0.5 \text{ at\%} \leq z \leq 6 \text{ at\%} \text{ and}$$

$$0 \leq m \leq 0.5, \text{ respectively,}$$

wherein the rapidly solidified alloy includes an $R_2Fe_{14}B$ -type compound, an α -Fe phase and an Fe_2B phase.

Claim 19 (original): The rapidly solidified alloy of claim 18, wherein 6 at% $\leq x \leq 8$ at%.